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ABSTRACT

What can employers assume about the literacy skills of General Educational Development (GED) program graduates? A subsample of 1,012 young adults, aged 21 to 25, selected from the Young Adult Literacy Survey (YALS) was used to study this question. The sample consisted of all Caucasians, African-Americans, and Hispanics in the following categories: (1) high school graduates with no college education; (2) high school dropouts who did not study for or pass the GED; (3) high school dropouts who studied for the GED but did not pass it; and (4) high school dropouts who passed the GED tests. These groups, demographic variables, and measures of literacy-related activities comprised the three predictors. The dependent variables were the YALS prose, document, and quantitative literacy scales. Results of a series of block entry multiple regressions suggested that employers could assume that certain reliable differences in literacy skills remained between educational groups after taking into account differences in demographic characteristics and literacy-related activities. Although high school graduates were only slightly more proficient in literacy skills than those completing a GED, relatively large and reliable differences existed between those who obtain a GED and those who drop out of high school and do not study for or pass the GED. Dropouts who study for but do not obtain a GED were statistically equivalent in literacy skills to those who drop out and do not study for the GED. (Contains 17 references and 5 data tables.) (YLB)

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NATIONAL CENTER ON ADULT LITERACY

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David Kaplan
Richard L. Venezky

University of Delaware

**TECHNICAL REPORT TR93-5**
**SEPTEMBER 1993**

U.S. DEPARTMENT OF EDUCATION
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# WHAT CAN EMPLOYERS ASSUME ABOUT THE LITERACY SKILLS OF GED GRADUATES?

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**Abstract**

*This paper considers the question: What can employers assume about the literacy skills of GED graduates? To address this question, a subsample of 1,012 young adults, ranging in age from 21 to 25 years, was selected from the Young Adult Literacy Survey (Kirsch & Jungeblut, 1986). The subsample was obtained by selecting all Caucasians, African-Americans, and Hispanics who did not have any college education and who had either (a) graduated from high school, (b) dropped out of high school and either did not study for or pass the GED, (c) dropped out of high school and studied for the GED but did not pass it, or (d) dropped out of high school but passed the GED Tests. These educationally differentiated groups, in addition to demographic variables and measures of literacy-related activities, comprised the three predictors in this study. The dependent variables were the prose, document, and quantitative literacy scales of the Young Adult Literacy Survey. The results of a series of block entry multiple regressions suggest that employers can assume that certain reliable differences in literacy skills remain between educational groups after taking into account differences in demographic characteristics and literacy-related activities. Although high school graduates are only slightly more proficient in literacy skills than those completing a GED, relatively large and reliable differences exist between those who obtain a GED and those who drop out of high school and do not study for or pass the GED. Dropouts who study for but do not obtain a GED are statistically equivalent in literacy skills to those who drop out and do not study for the GED.*

# INTRODUCTION

Students who leave high school before completion have four avenues for obtaining a high school degree or its equivalent.* Two require course work directed either by the National Home Study Council, which accredits correspondence schools, or the Carnegie unit system, which requires attendance at day or evening adult education courses (Webb, 1991). The remaining two alternatives, both of which are administered by the American Council on Education, are non-instructional and require performance at specified minimum levels on tests. They include the General Educational Development (GED) Tests, which assess five subject areas considered essential in the high school program, and a newly developed external diploma program, which assesses 64 general competencies and an individualized vocational skill.

Of these four alternatives, the GED is by far the most popular and accounts for about one sixth of all high school diplomas awarded in the last few years (Baldwin, 1990). Almost 17 million persons have taken the GED Tests since 1949, and from 1971 through 1991, 8.5 million received high school diplomas as a result of passing GED Tests (GED Testing Service, 1992). Not all states, however, provide a diploma for GED completion.

Since the 1966 Adult Education Act (AEA), federal funding has been provided for English-as-a-Second-Language, Adult Basic Education (ABE), and GED programs, all of which are viewed as contributing to educational progress that culminates with successful passing of the GED. Later amendments to the AEA expanded the scope of funding to Adult Secondary Education and workplace literacy programs. Federal funding began in FY 1967 with $26.3 million and rose to $238.8 million by FY 1992. Reported state and local support over the same period rose from $8.3 million to an estimated $560 million (Office of Vocational and Adult Education, 19??), although some of this increase may reflect improved reporting procedures.

Although the amount of federal, state, and local support has been large and increasing, assessment of the impact of funded programs on students' lives has been minimal. In a recent

* *The authors wish to thank Feng Yu for valuable research assistance and Page Bristow for informative comments.*

unpublished study, Cameron and Heckman (1991) questioned the value of the GED Tests, claiming that when years of schooling are equated, GED graduates and high school dropouts who do not complete a diploma have roughly the same expected earnings. In addition, they reported that high school graduates have higher completion rates in postsecondary education and in military service than GED graduates. Their conclusions contrast with self-report data collected by the GED Testing Service and the Iowa State Department of Education (Hartwick & Beder, 1992).

The present study explored the value of the GED as a certification mechanism by comparing the literacy skills of four groups of young adults, aged 21 to 25 years, who did not attend college: (a) high school graduates, (b) high school dropouts who passed the GED, (c) high school dropouts who studied for but did not pass the GED, and (d) high school dropouts who neither studied for nor passed the GED.

Specifically, what can employers assume about the literacy skills of GED graduates? Are they superior to those of high school dropouts who do not study for or pass the GED? Are they equivalent to the literacy skills of high school graduates? Literacy skills were measured in this study with tasks and materials similar to those found in home and commercial contexts under the assumption that these skills have some validity as predictors of job-related literacy performance. They, obviously, are not the only skills required for the job market, but they are important, nonetheless, and have been the focus of considerable concern.

# A. HISTORY OF THE GED

In 1942, a special committee of the U.S. Armed Forces recommended that appraisal tests be developed for accrediting the educational achievements of military personnel. A civilian team headed by Ralph Tyler at the University of Chicago was awarded a contract to develop high school equivalence tests "to measure the outcomes and concepts of a four-year high school (non-technical) education in the five areas of curriculum taught by all such high schools throughout the country" (Stewart, 1992, p. 18). The resulting tests were standardized in 1943, using 35,000 high school seniors selected from all 48 states. It was not until 1947, however, that the first GED Tests, consisting of English grammar, social studies, natural science, literature, and mathematics, were administered to members of the armed services and veterans. By 1953, state departments of education had begun to assume responsibility for the administration of the tests, and by 1959, civilians outnumbered military personnel among GED examinees.

The GED Tests have been re-normed four times since 1942 and have undergone two major revisions. The number of persons taking the tests rose slowly but steadily through the 1950s and early 1960s and then soared exponentially in the late 1960s and 1970s with federal and state funding of ABE and GED training programs. This trend peaked around 1979 and then declined steadily through the 1980s. More recently, it has reversed again with a 12% increase in the number of GED diplomas issued in 1991 over those issued in 1990 (American Council on Education, 1992). In 1991, the last year for which data are available, 770,254 persons took one or more of the GED Tests in the 50 states and American territories. Of these, 481,025 (62.5%) completed all five tests successfully (GED Testing Service, 1992).

## B. CONTENT OF THE GED TESTS

The current GED, revised in 1987, consists of five subtests: writing skills, social studies, science, interpreting literature and the arts, and mathematics. Except for an essay in the writing skills test, all tests are multiple choice, with five alternatives for each item. According to the GED *Official Teacher's Guide*, the tests measure three basic types of knowledge or ability: (a) content knowledge in the five test areas expected for graduating high school seniors, (b) cognitive skills—comprehension, application, analysis, synthesis, and evaluation—based upon what appears to be the Bloom taxonomy (Bloom, 1956), and (c) test-taking skills (Swartz et al., 1988, cited in Webb, 1991, pp. 12ff.).

The GED has been criticized for being anchored to a high school curriculum that many find deficient for modern needs because of its grading and certification standards and its lack of attention to functional skills (Webb, 1991). In addition, the performance of high schools in preparing students for the workplace has been re-examined and found to be deficient (Commission on the Skills of the American Workforce, 1990). Although the GED might be charged with leadership in the reform of secondary education, this has not been its traditional function, nor would it be particularly effective given the limitations of its role in the total educational system. In addition, such a change in its role might radically alter the function of the GED—from a high school equivalency examination to some other, as yet undefined, function—thus also altering its meaning and utility for colleges and businesses. These same arguments also could apply to the criticism that the GED does not measure the type of functional skills desired by employers. As long as the GED is considered an alternative route to a high school diploma, it cannot deviate markedly from either the content or the standards of the high school curriculum. A more valid criticism, however, could be made of its cognitive skills framework, which is outdated. Current work on problem solving and higher-level thinking skills has moved far beyond the ideas of the 1940s and 1950s, upon which the Bloom taxonomy is based (e.g., Glaser, 1984; Snow, 1989; Wittrock & Baker, 1991).

## C. CERTIFICATION VERSUS EDUCATION

The GED might be viewed as: a certification of competency which validates that an individual has attained specified levels of ability in the five areas assessed by the subtests, or an educational process that includes specified instruction along with assessment through validated instruments. If the latter were true, students would be expected to acquire the benefits of schooling that are usually left untapped by standardized tests, for example, increased exposure to ideas, concepts, and cultural norms, and socialization to a democratic society. In fact, no standardized curriculum exists for the GED, and attendance at a GED class is not a requirement to take the tests. A 1980 survey of 12,646 GED candidates found that 21% of the examinees did no preparation for the tests at all, 40.5% studied on their own from a book or manual, and only 22% took a GED practice test. Those who claimed to have studied, either alone or in a course, reported a median of 20 study hours (Malizio & Whitney, 1981). In 1989, 84% of examinees reported that they studied for the test, with a mean for reported hours of 30.5 (Baldwin, 1990). Although this is a 50% increase over the median number of hours reported in 1980, it is still far too low to be taken as evidence that GED preparation leads to the acquisition of a significant body of new knowledge, skills, or attitudes.

The GED should be viewed as a certification examination for high school dropouts that assigns a pass-fail score on the basis of scores on five subtests. Because of the way the minimum passing score is established, the average GED graduate outscores the average high school graduate on the tests. However, evidence from the Armed Forces Qualifying Test (AFQT) and studies of college, university, and technical school dropout rates indicate that GED graduates are inferior to high school graduates in a number of traits (Cameron & Heckman, 1991). While high school graduates are assigned grade-point averages or class rankings to scale their academic accomplishments over a four-year period, no such scaling is available for GED graduates, who at most receive a set of total scores. A university or business that wants to select only the *best* has a limited basis for comparison of GED graduates.

# D. IMPACT OF THE GED

Until Cameron and Heckman (1991), almost all of the GED impact studies were based upon self-reports. A typical example is a recent follow-up survey by the Iowa Department of Education of GED graduates from 1980, 1985, and 1988 (Hartwig & Beder, 1992). A random sample of 2,500 graduates was drawn for each of the target years and sent a 40-item survey that asked them to compare their lives just before taking the GED to their current lives in terms of employment and income, job skill level and satisfaction, sources of income and personal savings, and further education. As might be expected, respondents claimed that life was better in almost every category than it had been before completing the GED. Employment rates, hours worked per week, and personal income had all increased substantially, as had job satisfaction and economic benefits. A majority of those in the age group most likely to have children reported that earning a GED helped them "some" or "very much" in assisting their children with schooling.

However, the results of the Iowa study are tempered by a number of factors. The 7,500 graduates in the initial sample included only those who held an Iowa driver's license, and it was not reported what percentage they represented of all who completed the GED in the three target years. Further, 2,425 (32%) of the surveys mailed were not deliverable. Returns were eventually received from 1,597 respondents, for an unadjusted response rate of 21%. To test for response bias, a shortened version of the survey was mailed to a random sample of 600 *reachable* nonrespondents (200 for each year), with a promise to pay $5.00 upon receipt of the completed survey. Of this group, 207 (34.5%) responded. A comparison of the pay group with the original respondents revealed no response bias for gender, income, or educational level. However, the study did not control for those who did not hold Iowa driver's licenses or who were unreachable. A comparison of the ages of the responding sample to the ages of the total sample in the three years revealed significant differences between the two, with the younger age groups under-represented in the response sample.

Further, as the authors reported, no comparisons were made to high school graduates or to those who dropped out of high school and did not take or complete the GED. Although strong attempts were made to control for age and gender effects where possible, and to bring in available comparison data, the attribution of

positive or negative outcomes to the GED alone was not possible. Finally, as the authors themselves pointed out, the data were self-reported, and it is not known whether respondents under- or over-reported such factors as income, job success, and ability to assist children with schooling. In addition, the reliability of recall after 2, 5, and 10 years is unknown.

Studies by the GED Testing Service (e.g., Malizio & Whitney, 1981; Behan, 1983; Baldwin, 1990) were also based on self-reports. Malizio and Whitney, for example, sent a survey to 12,646 candidates from 250 randomly selected GED testing sites in the U.S. Of the three studies cited above, only Behan attempted to survey the impact of the GED on subsequent activities, which in this case was restricted to postsecondary education. An additional study, Cervero and Peterson (1982), was a follow-up mail survey of 458 of the examinees surveyed by Malizio and Whitney 18 months previously. Their questionnaire probed for expectations of employment and education as a result of the GED, as well as for information on the examinees' current status in these two areas. No attempt was made, however, to compare GED candidates to other groups. As noted above, Cameron and Heckman (1991) argued that GED graduates were inferior to high school graduates in many labor market and skills measures.

## E. PURPOSE OF THE STUDY

This study examined whether the conclusions of Cameron and Heckman generalize to literacy skills, a question that could be argued is of special relevance to employers.

Specifically, this study tested whether or not GED-certified students possess literacy skills comparable to those of high school graduates over and above what can be accounted for by demographic characteristics and individual literacy-related activities. In parallel, a comparison was also made of the literacy skills of GED graduates and high school dropouts who did not pass the GED. It is important to note that the study did not ask simply whether or not high school graduates and GED graduates have the same literacy skills. Literacy skills might vary according to age, race, parents' education, literacy activities, and a variety of other factors. Therefore, imbalances of these factors across the groups might account for differences, independent of any contribution made by the GED, or disguise what differences might truly exist.

# F. METHODOLOGY

## 1. SUBJECTS

The 1,012 subjects of the present study represent a selected subsample from the National Assessment for Educational Progress (NAEP) Young Adult Literacy Survey (YALS), which assessed 3,747 young adults, aged 21 to 25 years, on three scales of functional literacy (Kirsch & Jungeblut, 1986). The sample selected all Caucasian, African-American, and Hispanic YALS participants who had not enrolled in or attended college and who had either: (a) graduated from high school, (b) dropped out of high school and passed the GED, (c) dropped out of high school and studied for but did not pass the GED, or (d) dropped out of high school and neither studied for nor passed the GED.

About 50% of the YALS respondents who had not completed high school had studied for the GED, and 39.6% of them received the diploma. The probability that high school noncompleters would study for the GED correlated significantly with parents' education and with the respondents' years of schooling (grades K to 8 vs. some high school); the probability of GED success correlated mainly with ethnicity/race, with Caucasians and Hispanics showing twice the completion rate of African-Americans.

YALS administered three scales of functional literacy: prose literacy, document literacy, and quantitative literacy. Items on the three scales were open-ended; examinees composed short answers (words, phrases, and occasional sentences), although some items required underlining or circling of text. The scales were task-based, requiring examinees to find information, determine reasons or causes for arguments or positions, compare values on charts, and so forth. The prose literacy test involved tasks centered on continuous prose passages of one-half to one page in length. The document and quantitative literacy tests centered on charts, graphs, maps, catalogue entries, and the like, with the quantitative test requiring more mathematical operations than the document test. On all three tests, groups of two to five items were clustered around a single text or document. In contrast to tests of basic skills (e.g., reading comprehension, mathematical computation), YALS assessed functional literacy with documents and tasks drawn from everyday literacy experiences in the home, at work, and within the commercial and social community. Scoring for each scale was based upon item response theory (IRT), with linkage through a fourth scale to the NAEP reading test. The YALS has also been

linked to various national surveys of adult literacy carried out more recently by the Educational Testing Service. In addition to the tests, examinees responded to an extensive orally-administered background questionnaire.

Table 1 (see Appendix) shows means and standard deviations on the three literacy scales reported by YALS for each of the educational route groups in the present study.

## 2. Statistical Analyses

Block entry multiple regression was utilized to assess the effects of educational route in predicting performance on each of the three YALS scales after taking into account demographic characteristics and literacy activities. Three blocks of variables were formed.

The first block consisted of the following demographic variables:

SEX: *gender,* 0=females, 1=males

ETHNIC1 & ETHNIC2: *ethnicity/race,* two dummy vectors comparing Caucasians to African-Americans (ETHNIC1) and Hispanics to African-Americans (ETHNIC2)

MAED: *mother's educational attainment*

FAED: *father's educational attainment*

OCC1 & OCC2: *occupation,* two dummy vectors comparing managers, professionals, and technical workers to operatives, service workers, and laborers (OCC1) and salespersons, clerical workers, and craftsmen to operatives, service workers, and laborers (OCC2)

LITHOME: *home literacy history,* the sum of responses to items asking whether individuals had newspapers, magazines, 25 or more books, an encyclopedia, a dictionary, or a personal computer in their homes during high school.

Note: Although Cameron and Heckman (1991) found years of schooling to be the most important predictor of job success, YALS did not code this as a continuous variable, using only a single category for the high school years.

The second block consisted of the following literacy activities variables:

READNEWS: the sum of responses to whether or not individuals read various sections of the newspaper, for example, national news, advertisements, sports

READBOOK: the sum of responses to whether or not individuals read various kinds of books in the previous six months

READDOCS: the sum of responses to whether or not respondents read various types of documents

READMAG: the number of magazines that respondents read.

The third block consisted of three a priori specified comparisons among the four educational routes. In the tables (see Appendix) these educational routes are referred to as follows:

HS = high school graduates

GED-C = high school dropouts who studied for and completed the GED

GED-N = high school dropouts who studied for but did not complete the GED

DO = high school dropouts who neither studied for nor passed the GED.

The analysis compared HS to GED-C, GED-C to GED-N, and GED-N to DO. It is important to keep in mind that none of the individuals included in the present study had any college education at the time of the 1985 YALS survey.

For each of the three literacy scales, the blocks were entered into the equation one at a time with the demographic block entered first, the literacy activities block entered second, and the educational route block entered last. The results will be presented for each scale separately.

Note: Because of the large sample size, a significance level of 0.001 was assigned to the probability of a Type I error for both the overall model as well as the t-tests of individual regression coefficients.

# G. RESULTS

## 1. PROSE LITERACY

A regression of prose literacy performance on the demographic block of variables revealed that this block explained a significant proportion of the variance in prose literacy skills ($R^2$ = 0.359, adjusted $R^2$ = 0.354, $F_{8,1003}$ = 70.317, $p < .001$). When the literacy activities block was entered, the proportion of explained variance in prose literacy increased a significant 9% ($R^2$ = 0.446, adjusted $R^2$ = 0.439, $F_{12,999}$ = 66.932, $p < .001$). When the final educational route block was entered, the proportion of explained variance increased a significant 7% ($R^2$ = 0.518, adjusted $R^2$ = 0.511, $F_{15,996}$ = 71.306, $p < .001$).

The unstandardized and standardized regression coefficients, standard errors, and t-values for the analysis of prose literacy performance are displayed in Table 2 (see Appendix).

Within the demographic block, the most important predictor of prose literacy performance was race/ethnicity. On the average, there was a 34-point scale score difference between Caucasians and African-Americans and a 10-point scale score difference between Hispanics and African-Americans. In addition, significant differences were found on the gender variable, with females performing approximately 9 scale points higher than males. Mother's and father's educational attainment were also found to be significant predictors of prose literacy performance. However, neither the occupational variables nor the home literacy variable were significant predictors of prose literacy skills.

Within the literacy activities block, newspaper, book, and document reading were all positive significant predictors of prose literacy performance. An inspection of the standardized regression coefficients reveals that the three variables were nearly equal in predicting prose literacy skills. However, magazine reading was not a significant predictor.

Within the educational route block, high school graduates performed slightly but significantly better on the prose literacy scale than GED completers when demographics and literacy activities were controlled. Larger differences were found between GED completers and high school dropouts, with the GED completers performing significantly better. No significant

difference was found between GED noncompleters and dropouts at the .001 level.

### 2. Document Literacy

Regression of document literacy performance on the demographic block of variables revealed that this block explained a significant proportion of the variance in document literacy skills ($R^2$ = 0.312, adjusted $R^2$ = 0.307, $F_{8,1003}$ = 56.899, $p < .001$). When the literacy activities variables were entered, the proportion of explained variance in document literacy increased a significant 10% ($R^2$ = 0.412, adjusted $R^2$ = 0.405, $F_{12,999}$ = 58.290, $p < .001$). When the final educational route block was entered, the proportion of explained variance increased a significant 6% ($R^2$ = 0.472, adjusted $R^2$ = 0.465, $F_{15,996}$ = 59.464, $p < .001$).

The unstandardized and standardized regression coefficients, standard errors, and t-values for the analysis of the document literacy scale are displayed in Table 3 (see Appendix).

Within the demographic block the most important predictor of document literacy performance was race/ethnicity, with a 38-point scale score difference between Caucasians and African-Americans. The next most important predictor of document literacy skills was mother's educational attainment. Unlike prose literacy, no significant differences were found either between Hispanics and African-Americans or between males and females. Father's educational attainment, the two occupational variables, and home literacy history were not significant predictors of performance on the document literacy scale.

Within the literacy activities block, newspaper, book, and document reading were all positive significant predictors of document literacy performance after accounting for demographic characteristics. As can be seen from the standardized regression coefficients, document reading was the most important predictor in this block. However, as with prose literacy, magazine reading was not a significant predictor of document literacy skills.

Within the educational route block, small but significant differences in performance on the document literacy scale were found between high school graduates and GED completers, with graduates performing better. Larger differences were again found between GED completers and dropouts, with completers performing significantly better. No significant difference was found between GED noncompleters and dropouts at the .001 level. Again,

the results for educational route were found after accounting for demographic and literacy activity differences.

### 3. Quantitative Literacy

Regression of quantitative literacy performance on the demographic block of variables revealed that this block explained a significant proportion of the variance in quantitative literacy skills ($R^2$ = 0.299, adjusted $R^2$ = 0.293, $F_{8,1003}$ = 53.400, $p < .001$). When the literacy activities variables were entered, the proportion of explained variance in quantitative literacy increased a significant 6% ($R^2$ = 0.363, adjusted $R^2$ = 0.356, $F_{12,999}$ = 47.523, $p < .001$). When the final educational route block was entered, the proportion of explained variance increased a significant 6% ($R^2$ = 0.425, adjusted $R^2$ = 0.416, $F_{15,996}$ = 49.048, $p < .001$).

The unstandardized and standardized regression coefficients, standard errors, and t-values for the analysis of quantitative literacy performance are displayed in Table 4 (see Appendix).

Within the demographic block, the most important predictor of quantitative literacy performance was race/ethnicity, with a 40-point scale score difference between Caucasians and African-Americans. The next most important predictor was gender, with females outperforming males. No significant difference was found between Hispanics and African-Americans. In addition, mother's educational attainment, father's educational attainment, occupation, and literacy in the home were not significant predictors of quantitative literacy performance.

Within the literacy activities block, newspaper and document reading were positive significant predictors of quantitative literacy performance after accounting for demographic characteristics. As can be seen from the standardized regression coefficients, document reading was the most important predictor in this block. However, book and magazine reading were not significant predictors of quantitative literacy skills.

Within the educational route block, high school graduates again performed significantly better than GED completers but the differences were small. Larger differences were again found between GED completers and dropouts, with the GED completers performing significantly better after accounting for both demographic and literacy activity differences. No significant difference at the .001 level was found between GED noncompleters and dropouts.

# H. Interpreting Scale Score Differences

By assigning mean values to demographic, literacy practice, and educational route variables for each ethnic/racial group, predicted scale scores for literacy abilities can be obtained for the various noncollege groups. These are shown in Table 5 (see Appendix) for document literacy by sex and by ethnicity/race.

Three points should be noted. First, the analysis focused on the occupational group of operatives, service workers, and laborers. A cross-tabulation of occupational groups by educational routes showed that this occupational group was somewhat more heavily represented in the GED completer, GED noncompleter, and dropout educational routes. Second, the focus was on the document scale because the majority of the items (53) in the entire survey were mapped onto this scale (the remaining three scales had only 12 to 15 items each). Third, mean values on demographic, educational route, and literacy practice variables for each ethnicity/race group were based on the means for that group.

Several contrasts in Table 5 are of particular interest. First, regardless of race/ethnicity, females performed uniformly higher than males, although the differences were small. Second, Hispanic/African-American differences disappeared when demographic, literacy practices, and educational routes were controlled; however, within gender groups, Caucasian/African-American differences of approximately one standard deviation (or 40 scale points) remained. This result contrasts with what was found by Kirsch and Jungeblut (1986) in a similar analysis done on the total YALS population of 3,474 young adults. After controlling for demographic, educational, and literacy practice variables, Kirsch and Jungeblut still found about half of a standard deviation difference between Hispanics and African-Americans on the document scale. The difference in the full sample between Caucasians and African-Americans (44.3 scale points), however, is nearly identical to the Caucasian/African-American differences in the noncollege subgroups of the present study. Whether the differences between the two studies result from this study's focus on the last three occupational categories, peculiarities in the background variables of the various ethnicity/race groups, or from differences in methodologies remains to be determined. One clue may be that Caucasian and Hispanic GED completers in the

present study scored from one quarter to one third of a standard deviation below their respective total YALS subsamples, whereas African-American GED completers scored almost identically to the mean for African-Americans in the total survey population.

Most important for the present study, the mean differences across different educational routes indicate potentially significant differences in the literacy abilities of the different groups. However, before such a claim can be made, the analysis techniques used in YALS need to be examined. Using IRT scaling, both items and subgroups were mapped onto 0 to 500 point scales with means set at 305 and standard deviations equal to 50. Placement of an item at a particular scale location is interpreted to mean that the subgroups (or individuals) at that same scale score had an 80% probability of answering the item correctly. (In the other NAEP surveys, a further requirement was that individuals at the next lower scale location had to have less than a 50% probability of doing the item correctly.) That an item is placed at a relatively high scale location, however, does not mean that no one with a score below that level answered the item correctly. For example, a particular document scale item with a scale location of 300 was answered correctly by 54% of the individuals who received scale scores of 250, 25% of those at 200, and 9% of those at 150. Thus, even though only 57.2% of the total survey population scored at or above 300, 79.5% answered this item correctly.

Depending on how steeply an item's characteristic curve rises through its 80% probability level, individuals at scale score locations descending from the item's location will more rapidly or slowly decline from an 80% probability of correct response. Thus, the differences in performance for subgroups at scale locations a standard deviation apart will vary according to the items involved. Therefore, it is difficult to characterize scale locations by particular items at those same locations without examining how rapidly the probabilities of correct scores for those items decline with declining scale scores for the subgroups of interest.

Document scale items involve searching for information within a particular document, with subsequent processing ranging from filling in requested information to marking or recording what was found. In general, the difficulty level of a document item is dependent upon three characteristics: (a) the number of features of information required for a correct match within a document, (b) the relationship between the description of the search features and their appearances within the document, and (c) the number of potential targets within the document that share at least one feature with the correct target. Scaling of these characteristics is complex,

however, not only because they are not well understood individually but also because their interactions are difficult to predict. For example, some search features may be more salient than others, thus overriding the potential influence of non-overlap between search request and document wording, and some incorrect targets may not function as distractors, especially if they are located beyond the conventional search area for the correct target.

With these caveats and complications, the analyses suggest, from an inspection of document scale items with scale locations in the range 215–300, that differences between GED completers and GED noncompleters are significant in terms of the literacy abilities required to do YALS items, whereas the differences between high school graduates and GED completers are, at most, marginally significant. Differences of a standard deviation on the document scale could be interpreted roughly as differences in ability to handle a single task feature, whether this be a search feature, an additional distractor, or an additional operation. According to Kirsch and Jungeblut (1986), the 300 level of the document scale is characterized by tasks that require a three-feature search with one or more distractors, or successive two-feature searches. The 250 level, therefore, might have three-feature searches with no distractors or two-feature searches with one distractor. Performance differences, therefore, could be defined by differences in probabilities of correctly filling in forms, writing short descriptions, or extracting information from charts, graphs, tables, and so forth. Differences of half of a standard deviation or more appear to have significant consequences for literacy performance.

# I. CONCLUSIONS

Cameron and Heckman (1991) found that when the years of schooling were controlled, GED graduates did not differ in any meaningful way from high school dropouts on labor market measures such as wages, earnings, hours of work, unemployment experience, or job tenure. This absence of difference was found regardless of whether or not ability, as measured by the AFQT, was controlled. Cameron and Heckman argued that any benefit accrued from being GED-certified arises only from its value in opening up opportunities for postsecondary education and training.

The present study suggests that caution should be exercised before concluding that there are no relevant labor market returns for obtaining a GED. The results of this study showed reliable differences in literacy skills between educational groups after taking into account differences in demographic characteristics and literacy-related activities. Specifically, high school graduates did not differ substantially from those completing a GED on prose, document, or quantitative literacy skills. The differences, although statistically significant, represented only about a quarter of a standard deviation on all three tests. In contrast, relatively large and reliable differences—representing approximately one half of a standard deviation—were found between those who obtained a GED and those who dropped out of high school and did not study for or pass the GED. Dropouts who studied for but did not obtain a GED were statistically equivalent in literacy skills to those who dropped out and did not study for the GED. It should be noted that, unlike Cameron and Heckman (1991), this study was unable to control for the number of years of education. However, the analysis did control for demographic characteristics and literacy activities that have been found to be correlated with years of education.[1]

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[1] *It should also be noted that the sample that was examined consisted of young adults from 21 to 25 years of age. Since the average age of a GED examinee is about 26 (GED Testing Service, 1992), this sample may be atypical of GED completers. Further studies need to be done on the National Adult Literacy Survey (NALS) data—which sampled 16-year-olds and older, with no upper bound on age—when they become available, to determine if the results reported here hold for the general U.S. population. Replication with NALS should be a stronger test of educational route differences because years of schooling is a continuous variable in the NALS background data.*

The implication of the present study for employers is that young adult applicants with a GED are roughly equivalent to high school graduates in literacy skills and significantly better than dropouts who did not study for or complete the GED. It cannot be claimed, however, that any differences in literacy skills found were related to studying for the GED. Since the average GED examinee in 1989 spent only 30.5 hours in preparation, one can not reasonably assume that studying per se made a significant contribution to literacy ability. Furthermore, most GED preparation involves taking GED Practice Tests and similar exercises rather than instruction in the skills assessed by YALS. (The overlap between the GED Practice Tests and YALS exercises is small.)

The differences found in literacy abilities, therefore, must result from a selection rather than a training or practice factor; that is, those who studied for and completed the GED must have had higher literacy skills upon leaving high school than those who did not complete the GED. For employers, this means that a GED student will have literacy skills only slightly lower than those of a high school graduate, whereas non-GED dropouts will have, on the average, far lower literacy skills than high school graduates.

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# APPENDIX


| | | |
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**Table 1. Mean (Standard Deviation) Literacy Abilities**

| Educational Route | Literacy Scale | | | |
|---|---|---|---|---|
| | N | Prose | Document | Quantitative |
| High school graduate | 698 | 272 (35) | 274 (42) | 280 (41) |
| GED completer | 59 | 270 (29) | 278 (37) | 275 (38) |
| GED noncompleter | 83 | 245 (33) | 242 (49) | 247 (48) |
| Drop out (non-GED) | 172 | 231 (42) | 224 (56) | 238 (47) |

**Table 2. Block Entry Multiple Regression Results for the Prose Literacy Scale: Final Model**

| Variable | Unstandardized Coefficient | Standardized Coefficient | Standard Error | *t*-value | *p*-value |
|---|---|---|---|---|---|
| Intercept | 197.479 | 0.000 | 4.603 | 42.903 | .001 |
| | | | | | |
| SEX | -9.138 | -0.114 | 1.780 | -5.133 | .001 |
| ETHNIC1 | 34.954 | 0.434 | 2.114 | 16.536 | .001 |
| ETHNIC2 | 9.977 | 0.088 | 2.908 | 3.431 | .010 |
| MAED | 2.758 | 0.110 | 0.623 | 4.425 | .001 |
| FAED | 1.883 | 0.085 | 0.539 | 3.487 | .001 |
| OCC1 | 6.352 | 0.053 | 2.892 | 2.196 | .028 |
| OCC2 | 1.176 | 0.014 | 1.934 | 0.608 | .543 |
| LITHOME | 1.271 | 0.032 | 0.970 | 1.309 | .191 |
| | | | | | |
| READNEWS | 1.629 | 0.113 | 0.370 | 4.403 | .001 |
| READBOOK | 2.744 | 0.101 | 0.652 | 4.206 | .001 |
| READDOCS | 1.155 | 0.130 | 0.236 | 4.900 | .001 |
| READMAG | 0.500 | 0.021 | 0.587 | 0.853 | .394 |
| | | | | | |
| HS v. GED-C | 14.195 | 0.211 | 1.564 | 9.077 | .001 |
| GED-C v. DO | 21.507 | 0.250 | 2.729 | 7.882 | .001 |
| GED-N v. DO | -7.212 | -0.089 | 2.567 | -2.810 | .005 |

*Note:* The average across five plausible values was used for analysis. Estimates were obtained after all blocks were entered. HS = High School graduate; GED-C = GED completer; GED-N = GED noncompleter; DO = Dropout

**Table 3. Block Entry Multiple Regression Results for the Document Literacy Scale: Final Model.**

| Variable | Unstandardized Coefficient | Standardized Coefficient | Standard Error | *t*-value | *p*-value |
|---|---|---|---|---|---|
| Intercept | 180.309 | 0.000 | 5.975 | 30.176 | .001 |
| | | | | | |
| SEX | -6.889 | -0.069 | 2.311 | -2.981 | .003 |
| ETHNIC1 | 38.118 | 0.381 | 2.744 | 13.891 | .001 |
| ETHNIC2 | 6.298 | 0.045 | 3.775 | 1.668 | .096 |
| MAED | 3.301 | 0.106 | 0.809 | 4.080 | .001 |
| FAED | 0.317 | 0.012 | 0.701 | 0.452 | .651 |
| OCC1 | 11.919 | 0.079 | 3.755 | 3.174 | .002 |
| OCC2 | 5.402 | 0.053 | 2.510 | 2.152 | .032 |
| LITHOME | 2.100 | 0.043 | 1.260 | 1.667 | .096 |
| | | | | | |
| READNEWS | 1.638 | 0.092 | 0.480 | 3.412 | .001 |
| READBOOK | 2.789 | 0.083 | 0.847 | 3.293 | .001 |
| READDOCS | 1.868 | 0.169 | 0.306 | 6.105 | .001 |
| READMAG | 2.059 | 0.069 | 0.762 | 2.702 | .007 |
| | | | | | |
| HS v. GED-C | 13.411 | 0.160 | 2.030 | 6.606 | .001 |
| GED-C v. DO | 28.436 | 0.267 | 3.542 | 8.028 | .001 |
| GED-N v. DO | -9.582 | -0.096 | 3.332 | -2.875 | .004 |

*Note:* The average across five plausible values was used for analysis. Estimates were obtained after all blocks were entered. HS = High School graduate; GED-C = GED completer; GED-N = GED noncompleter; DO = Dropout

**Table 4. Block Entry Multiple Regression Results for the Quantitative Literacy Scale: Final Model.**

| Variable | Unstandardized Coefficient | Standardized Coefficient | Standard Error | *t* -value | *p*-value |
|---|---|---|---|---|---|
| Intercept | 203.347 | 0.000 | 5.803 | 34.694 | .001 |
| | | | | | |
| SEX | -7.599 | -0.082 | 2.245 | -3.385 | .001 |
| ETHNIC1 | 39.959 | 0.429 | 2.665 | 14.993 | .001 |
| ETHNIC2 | 7.931 | 0.062 | 3.667 | 2.163 | .030 |
| MAED | 1.592 | 0.055 | 0.786 | 2.026 | .043 |
| FAED | 1.136 | 0.045 | 0.681 | 1.669 | .095 |
| OCC1 | 5.764 | 0.041 | 3.647 | 1.580 | .114 |
| OCC2 | 6.509 | 0.069 | 2.438 | 2.670 | .008 |
| LITHOME | 0.716 | 0.016 | 1.223 | 0.585 | .559 |
| | | | | | |
| READNEWS | 1.584 | 0.095 | 0.466 | 3.396 | .001 |
| READBOOK | 1.141 | 0.036 | 0.822 | 1.387 | .166 |
| READDOCS | 1.283 | 0.125 | 0.297 | 4.321 | .001 |
| READMAG | 1.845 | 0.066 | 0.741 | 2.492 | .013 |
| | | | | | |
| HS v. GED-C | 15.698 | 0.201 | 1.972 | 7.961 | .001 |
| GED-C v. DO | 23.743 | 0.239 | 3.440 | 6.901 | .001 |
| GED-N v. DO | -10.470 | -0.112 | 3.237 | -3.235 | .002 |

*Note:* The average across five plausible values was used for analysis. Estimates were obtained after all blocks were entered. HS = High School graduate; GED-C = GED completer; GED-N = GED noncompleter; DO = Dropout

**Table 5. Predicted Scores for Document Literacy by Ethnicity, Gender, and Educational Route**

| | | Educational Route | | | |
|---|---|---|---|---|---|
| **Ethnicity** | **Gender** | **HS** | **GED-C** | **GED-N** | **DO** |
| | | | | | |
| Caucasian | Male | 282 | 297 | 259 | 269 |
| | Female | 289 | 304 | 266 | 275 |
| African-American | Male | 240 | 255 | 217 | 227 |
| | Female | 247 | 262 | 224 | 234 |
| Hispanic | Male | 241 | 256 | 218 | 227 |
| | Female | 248 | 263 | 225 | 234 |

*Note:* Predicted scores are for the occupational group of operatives, service workers, and laborers. Mean values of the predictor variables were based on ethnic subgroup mean values. HS = High School graduate; GED-C = GED completer; GED-N = GED noncompleter; DO = Dropout